2. THE ARES PROGRAM AIRCRAFT

Excluding the sonde data, the measurements described in this report were made from instrumentation flown on a WB-57F Canberra high-altitude research aircraft (NASA 928), shown in Figure 1.[5] It is based at Ellington Field, an offsite extension of the NASA Johnson Spaceflight Center in Houston, TX. This type of aircraft was developed from the English Electric Canberra which had its first flight over 40 years ago. Some 500 Canberras were license-built in the United States by General Dynamics, and through the years, many modifications were made, including a much larger wing, nose radome, auxiliary underwing jets, turbofan engines, and a large square-cut fin.[6] Specifications are listed in Table 1.[5] The aircraft has been modified to mount the instrumentation described in the next Section.

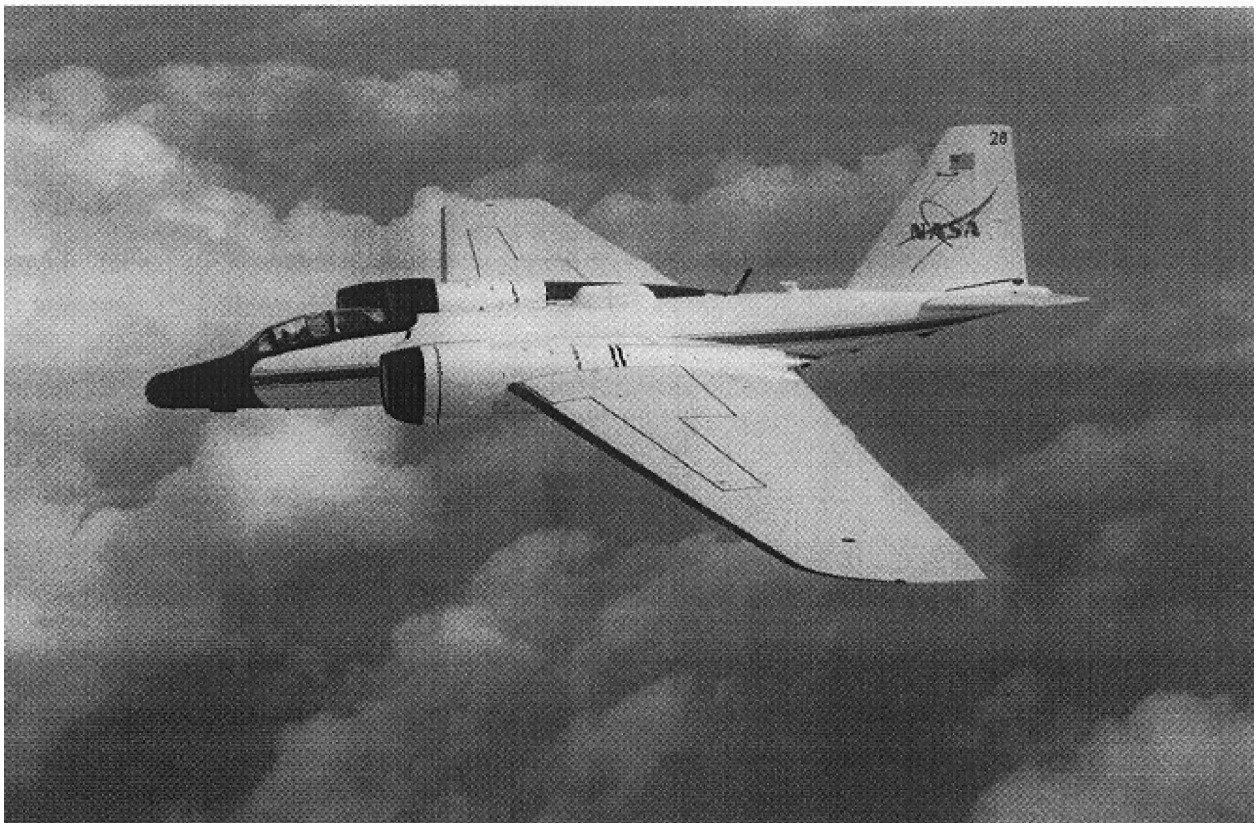

Figure 1. WB-57F (NASA 928) High-Altitude Research Aircraft

Table 1. Aircraft Specifications

Type	WB-57F, NASA 928
Length	21 m
Wingspan	37 m
Crew	Two
Maximum Altitude	~21 km (load dependent)
Air Speed	~800 km/hr (altitude dependent)
Maximum Mission Duration	6 hours
Maximum Range	~4,300 km

Table 2. Spectrometer Mode Estimated 80 Hz NESR

Spectral Column # (1-75)	**Column Center Wavelength (µm)**	**Est Cold Sky Background (12-bit Counts)**	**Est Noise Background (RMS Counts)**	**Column Bandwidth (µm)**	**Noise-Equivalent Spectral Radiance NESR µW/cm^2-sr-µm**
1	2.00	500	0.7	0.020	3.50
10	2.23	550	0.8	0.028	2.71
25	2.84	700	0.9	0.049	1.45
40	3.82	1100	1.0	0.067	0.46
50	4.59	1700	1.2	0.070	0.41
60	5.32	2200	1.4	0.065	0.54
75	6.30	1600	1.2	0.059	1.42